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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/881,218	06/13/2001	Ansheng Liu	042390P11429	7592

7590

04/29/2003

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EXAMINER

PRITCHETT, JOSHUA L

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 04/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/881,218

Applicant(s)

LIU ET AL.

Examiner

Joshua L Pritchett

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5 and 7-9 rejected under 35 U.S.C. 102(e) as being anticipated by Goodfellow (US 6,363,202).

Regarding claim 1, Goodfellow discloses directing an optical beam into a first end of an optical path having the first end and a second end disposed in a semiconductor substrate (col. 3 line 19). Goodfellow further discloses reflecting a first portion of the optical beam having a first center wavelength back out from the first end of the optical path (col. 3 lines 35-36, Fig. 2A). A Bragg grating inherently reflects a wavelength in the opposite direction of the incident light and the reflected light would travel back out the end of the optical path. Goodfellow further discloses tuning the optical path to reflect a second portion of the optical beam having a second center wavelength back out from the first end of the optical path (col. 3 lines 15-18). By tuning a

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Bragg grating a second wavelength will inherently be reflected back out the first end of the optical path.

Regarding claim 2, Goodfellow discloses the optical beam to remain within the optical path between the first and second ends with an optical waveguide disposed in the semiconductor substrate between the first and second ends (col. 3 lines 24-26). Goodfellow discloses that the optical paths guide the optical beams and therefore the optical beams must inherently stay within the optical path.

Regarding claim 3, Goodfellow discloses adjusting the effective index of refraction of the optical path through the semiconductor substrate along the optical path (col. 3 lines 43-44).

Regarding claim 4, Goodfellow discloses tuning the optical path comprising adjusting a temperature of the semiconductor substrate with a heater disposed proximate to the optical path through the semiconductor substrate (col. 3 lines 16-19).

Regarding claim 5, Goodfellow discloses tuning the optical path comprising modulating charge in the optical path through the semiconductor substrate in response to a modulating signal (col. 5 lines 17-21).

Regarding claim 7, Goodfellow discloses reflecting the first portion of the optical beam comprises perturbing an effective index of refraction a plurality of times along the optical path to form a Bragg grating (col. 3 lines 30-31).

Regarding claim 8, Goodfellow discloses perturbing the effective index of refraction the plurality of times along the optical path comprises periodically or quasi-periodically disposing silicon and polysilicon in the semiconductor substrate along the optical path (col. 3 lines 15-20).

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Goodfellow teaches a semiconductor waveguide case, and the group of materials that fit into the category of semiconductor inherently includes silicon and polysilicon.

Regarding claim 9, Goodfellow discloses perturbing the effective index of refraction the plurality of times along the optical path comprises periodically or quasi-periodically changing geometry of the optical path along the optical path (col. 3 line 52 – col. 4 line 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goodfellow in view of Kapany (US 6,480,513).

Goodfellow teaches the invention as claimed but lacks reference to the use of the conductor-insulator-semiconductor structure. Kapany teaches the claimed conductor-insulator-semiconductor structure for using charge modulation to tune an optical path (Fig. 4B). It is well known in the art that cladding (48) can be made of plastic and the core (47) can comprise a semiconductor material, such as germanium (col. 6 lines 59-61). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to equip the Goodfellow

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reference with the structure taught by Kapany for the purpose of altering the state of the optical path without directing passing current through the optical path.

Response to Arguments

Applicant's arguments, see Paper No. 7, filed March 31, 2003, with respect to the rejection(s) of claim(s) 1-9 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua L Pritchett whose telephone number is 703-305-7917. The examiner can normally be reached on Monday - Friday 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on 703-308-1687. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

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JLP
April 24, 2003

A handwritten signature in black ink, consisting of a large, sweeping 'A' followed by a smaller, more complex flourish.

**Audrey Chang
Primary Examiner
Technology Center 2800**